Applicants respectfully traverse these rejections in view of the amendment because the cited references do not disclose or suggest every element of any pending claim, as the following analysis shows.

Independent claim 1 recites forming a metal interconnect structure above the substrate and subsequently forming the CDO layer between the elements of the metal interconnect structure. Support for this may be found in Fig. 2 and the related text of the specification. Uglow does not disclose or suggest this configuration of elements or performing this process on those elements. Uglow only discloses forming metallic interconnects after the CDO layer is formed. Claims 2-6 depend from claim 1 and therefore contain the same limitations not disclosed or suggested by Uglow.

Independent claims 7 and 27 each recite a concentration of dopant that varies linearly from top to bottom of the CDO. Support for this may be found in Fig. 2 and at page 5 lines 22-23 of the specification. Uglow does not disclose or suggest this limitation. The only concentration profile disclosed by Uglow is the discontinuous profile shown in Uglow's Fig. 8B. Claims 8-10 and 28-29 depend from claims 7 and 27, respectively, and therefore contain the same limitation not disclosed by Uglow.

New claims 30 and 31 each recite a concentration of dopant with a concave or convex profile, while new claims 32 and 33 each recite a concentration of dopant with an S-shaped profile. Support for these limitations may be found in Figs. 4 and 5 and the related text of the specification. Each of these claims requires that the dopant concentration not only be varied in a non-linear manner while the CDO layer is being deposited, but that the direction of change in concentration be reversed during the

deposition operation. Uglow does not disclose or suggest any intention or capability to perform such a reversal.

CONCLUSION

For the foregoing reasons, Applicant submits that claims 1-10 and 27-33 are now in condition for allowance, and indication of allowance by the Examiner is respectfully requested. If the Examiner has any questions concerning this application, he or she is requested to telephone the undersigned at the telephone number shown below as soon as possible. If any fees or credits are found that are not otherwise covered, please charge any insufficiency or credit any overpayment to Deposit Account No. 02-2666.

Respectfully submitted,

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APPENDIX A

Marked-up version of amended claims

1. (Amended once) A process comprising:

forming a metal interconnect structure onto a substrate, said metal interconnect structure extending above a surface of the subsrate;

forming, subsequent to said forming a metal interconnect structure, a carbon-doped oxide (CDO) layer with a first concentration of carbon dopants therein on said substrate and between elements of said metal interconnect structure; and

continuing to form, subsequent to said forming a CDO layer with a first concentration of carbon dopants, said CDO layer further above said metal interconnect structure with a second concentration of carbon dopants therein, wherein the first concentration is different than the second concentration.

2. (Amended once) The process according to Claim 1 further comprising:

forming, subsequent to said continuing to form, the CDO layer further with a third concentration of carbon dopants therein, wherein there is a linear correlation of the concentration of carbon dopants between the first concentration , the second concentration, and the third concentration.

3. (Amended once) The process according to Claim 1 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein the first and third concentrations are higher than the second

concentration. [there is a concave nonlinear correlation between the first concentration, the second concentration, and the third concentration.]

4. (Amended once) The process according to Claim 1 further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein the first and third concentrations are lower than the second concentration. [there is a convex nonlinear correlation between the first concentration, the second concentration, and the third concentration.]

7. (Amended once) A process comprising:

forming a carbon-doped oxide (CDO) layer with a [first] concentration of carbon dopants therein;

wherein the concentration varies substantially linearly from a top of the CDO layer to a bottom of the CDO layer.

[and continuing to form said CDO layer further with a second concentration of carbon dopants therein, wherein the first concentration is different than the second concentration.]

8. (Amended once) The process according to Claim 7 wherein the concentration is higher at the top of the CDO layer and lower at the bottom of the CDO layer. [further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a linear correlation between the first concentration, the second concentration, and the third concentration.]

9. (Amended once) The process according to Claim 7 wherein the concentration is lower at the top of the CDO layer and higher at the bottom of the CDO layer. [further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a concave nonlinear correlation between the first concentration, the second concentration, and the third concentration.]

10. (Amended once) The process according to Claim 7 wherein the concentration varies between about 1 percent and about 20 percent by atomic mass. [further comprising:

forming the CDO layer further with a third concentration of carbon dopants therein, wherein there is a convex nonlinear correlation between the first concentration, the second concentration, and the third concentration.]

11-23. (Cancelled)

27. (New) An apparatus, comprising:

a carbon-doped oxide (CDO) layer having an interconnection structure disposed within the CDO layer and having a concentration of dopant that varies substantially linearly from a top of the CDO layer to a bottom of the CDO layer.

28. (New) The apparatus of claim 27, wherein the concentration is higher at the top of the CDO layer than at the bottom of the CDO layer.

29. (New) The apparatus of claim 27, wherein the concentration is lower at the top of the CDO layer than at the bottom of the CDO layer.

30. (New) An interlayer dielectric comprising:

a carbon-doped oxide (CDO) layer having a first region with a first concentration of carbon dopants therein, a second region disposed on the first region and having a second concentration of carbon dopants therein, and a third region disposed on the second region and having a third concentration of dopants therein,

wherein the first and third concentrations are higher than the second concentration.

31. (New) An interlayer dielectric comprising:

a carbon-doped oxide (CDO) layer having a first region with a first concentration of carbon dopants therein, a second region disposed on the first region and having a second concentration of carbon dopants therein, and a third region disposed on the second region and having a third concentration of dopants therein,

wherein the first and third concentrations are lower than the second concentration.

32. (New) An interlayer dielectric comprising:

a carbon-doped oxide (CDO) layer having a first region with a first concentration of carbon dopants therein, a second region disposed on the first region and having a second concentration of carbon dopants therein, a third region disposed on the second region and having a third concentration of carbon dopants therein, and a fourth region disposed on the third region and having a fourth concentration of carbon dopants therein;

wherein the first and third concentrations are each higher than either of the second and fourth concentrations.

33. (New) An interlayer dielectric comprising:

a carbon-doped oxide (CDO) layer having a first region with a first concentration of carbon dopants therein, a second region disposed on the first region and having a second concentration of carbon dopants therein, a third region disposed on the second region and having a third concentration of carbon dopants therein, and a fourth region disposed on the third region and having a fourth concentration of carbon dopants therein;

wherein the first and third concentrations are each lower than either of the second and fourth concentrations.